CLAIMS

1. A process for metal finishing comprising contacting the surface of a metallic part or material with a solution which contains 0.1% to 60% by weight of free dithionic acid, wherein said metal finishing improves the mechanical, chemical or aesthetic properties of said metallic part or material.

2. The process of claim 1 wherein said solution further comprises at least 100 ppm of sulfuric acid.

3. A process for depositing a metal layer on the surface of a solid part or material comprising contacting said solid part or material with an electroplating solution composition comprising 0.1% to 60% by weight free dithionic acid.

4. The process of claim 3 wherein said electroplating solution composition further comprises at least 100 ppm of sulfuric acid.

5. A process for depositing a metal layer on the surface of a solid part or material comprising contacting said solid part or material with an electroplating solution composition comprising dissolved metal dithionate or ammonium dithionate salts at a concentration of 0.1 molar or greater.

6. The process of claim 5 wherein said electroplating solution composition further comprises at least 100 ppm of metal sulfate or ammonium sulfate.

7. A process for cleaning or activating the surface of a metallic part or material prior to another treatment process, storage or sale comprising contacting said metallic part or material with a surface cleaning solution composition comprising 0.1% to 60% by weight free dithionic acid.

8. The process of claim 7 wherein said surface cleaning solution further comprises at least 100 ppm of sulfuric acid.

9. The process of claim 7 wherein said metallic part or material is a ferrous based alloy.

10. The process of claim 7 wherein said solution functions primarily as a rust removing agent.

11. A process for cleaning or activating the surface of a metallic material, other than copper, comprising contacting said metallic material with a surface cleaning or activating solution composition comprising dissolved metal dithionate or ammonium dithionate salts at concentrations of 0.1 molar or greater.

12. The process of claim 11 wherein said surface cleaning solution further comprises at least 100 ppm of metal sulfate or ammonium sulfate.

13. The process of claim 11 wherein said metallic part or material is a ferrous based alloy.

14. The process of claim 11 wherein said solution functions primarily as a rust removing agent.

15. A process for depositing metal on a solid part or material through an electroless or immersion mechanism comprising contacting said solid part or material with a solution comprising 0.1% to 60% by weight free dithionic acid.

16. The process of claim 15 wherein said solution further comprises 100 ppm or more of sulfuric acid.

17. The process of claim 15 wherein said electroless plating solution is a part of an electroless tin plating system.

18. A process for depositing metal on a solid part or material through an electroless or immersion mechanism comprising contacting said solid part or material with a solution comprising dissolved metal dithionate or ammonium dithionate salts at a concentration of 0.2 M or greater.

19. The process of claim 18 wherein said solution further comprises at least 100 ppm or more of metal sulfate or ammonium sulfate.

20. The process of claim 18 wherein said electroless plating solution is a part of an electroless tin plating system.

21. A process for depositing tin on a solid part or material through an electroless plating mechanism comprising contacting said solid part or material with a solution comprising dissolved ammonium dithionate salts at concentrations greater than 0.1M in metal.

22. A metallic substrate having at least one surface in contact with an aqueous solution, wherein said substrate is a metallic solid part or material, and said aqueous solution comprises either a) 0.1% to 60% by weight free dithionic acid and 100 ppm or more of sulfuric acid or b) dissolved metal dithionate or ammonium dithionate salts at a concentration of 0.1 or greater and at least 100 ppm of metal sulfate or ammonium sulfate.